DIFFERENCES IN THE BIOMECHANICAL RESPONSE BETWEEN HEALTHY AND LOW BACK PAIN PATIENTS FROM A ISOMETRIC EXTENSION TEST

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Purpose: To compare, in healhty subjects and low back pain patients, the erector spinal muscle response in a máximum isometric contraction intensities using simultaneously electromyography and ultrasonography.

Participants: 59 subjects: 33 Healthy persons (45% ♀). 26 LBP patients (39% ♀) with a mean age of 30.39 (±7.785).

Methods: Cross sectional study. Participants, following a maximal strength test as measured by a load cell, perform an isometric contraction of maximum strength. From sitting, each subject develops a maximum isometric lumbar extension, locked at 45 degrees from vertical. The hip and this of the subject were attached by a strap. After preliminary training, each subject performed three repetitions of described gesture resting for a minute and a half between each attempt. Records were taken throughout the maximum contraction, EMG signal and a ultrasonography image, for each ES (right and left). Measured torque, inclination angle, thickness and electromyography activation (MVC).

Analysis: We performed a descriptive analysis of both groups and subsequently made T-Student test for independent data in each of the variables measured.

Results: Mean values for groups of healthy subjects and low back pain patients were, respectively: Torque: 61.652 (±20.137); 70.298 (±25.053). Right Angle: 6.48 (±2.181); 7.15 (±2.53). Left Angle: 5.36 (±2.26); 6.38 (±1.86). Right Thickness: 0.031 (±0.005); 0.033 (±0.008). Left Thickness: 0.032 (±0.006); 0.034 (±0.006). Right MVC: 558.64 (±211.029); 576.15 (±267.69). Left MVC: 589.21 (±257.739); 671.15 (±370.722). No significant differences were found in any variable when comparing the results between healthy subjects and low back pain patients. Torque: −8.65 (±9.02) (p = 0.347). Angle: Right: −0.659 (±0.613) (p = 0.280); Left: −1.021 (±0.549) (p = 0.068). Thick-ness: Right: 0.00 (±0.00) (p=0.259); Left: 0.00 (±0.00) (p=0.069). MVC: Right: -17.52 (±62.29) (p=0.780). Left: −81.84 (±81.91) (p = 0.321).

Conclusions: Knowing how the erector spinal muscle behaves in a isometric back extension test, noting that biomechanically there are not significant differences in the responses with respect to a healthy subject, physical therapists could perform planning treatment which is the biopsychosocial model supported by the biomechanical model.